



# CALIFORNIA STATE SCIENCE FAIR 2009 PROJECT SUMMARY

<b>Name(s)</b> Victor H. Liu	<b>Project Number</b> <b>J1027</b>
<b>Project Title</b> <b>Are Solar Panels Right for You?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My goal was to test solar panels to see how they acted under different conditions, since most sources of information assume that the conditions are sunny. On sunny days in the northern hemisphere, south is the best direction for a solar panel to face. However, what if the sky is overcast? Would other directions than south be more efficient?</p> <p><b>Methods/Materials</b> The materials used in this experiment were a ruler, a protractor, some pieces from a solar car kit, a miniature solar panel, a foam board, a compass, a digital clock, masking tape, a small table, a multimeter, and probes. I took a solar car and removed all wheels and motors. Also, I drew all eight directions of the compass rose on a board. For several days, I set up the board and the solar panel, which was at approximately 63.2 degrees. This experiment took place from 9 am to 4 pm. Every hour, I would set the solar panel on each direction and measured the amount of current produced.</p> <p><b>Results</b> On the first day, it was sunny. This data made complete sense, with the current producing as hypothesized. It also appeared that the eastward and westward directions produced different amounts of current. On the second day, no sun shined through the overcast. The solar panel facing south was the top current producer, but the difference was insignificant. On the third day, clouds were in the sky and continually moved and the data was inconsistent. On the sixth day, the weather was sunny again and was similar to the results of day one.</p> <p><b>Conclusions/Discussion</b> Like many of my sources stated, south was the best direction on sunny days. I found out that in other conditions, south is the optimal direction for a solar panel. However, in days with heavy overcast, the difference between south and the other directions is very slight. Also, I found out the eastward and westward didn't produce the same amounts of current. I hypothesized that this was because the sunlight weakens as it sets. In addition, I discovered that the sunnier the weather is, the farther apart the highest and lowest current productions are. The opposite is true as well. Also, I discovered that sunny days do not differ in the strength of sunlight. This was discovered when the two sunny days' current productions had very similar milliamp levels. Ultimately, in order of best current producer to worst, the order is south, southeast, southwest, east, west, northeast, northwest, and north.</p>	
<b>Summary Statement</b> This project is about testing if a solar panel facing a suboptimal direction under different conditions will produce more current than a solar panel facing the optimal direction.	
<b>Help Received</b> Father helped with buying materials.	